(No Model.)

2 Sheets—Sheet 1.

F. SOPER.

ORE CONCENTRATOR.

No. 600,096.

Patented Mar. 1, 1898.

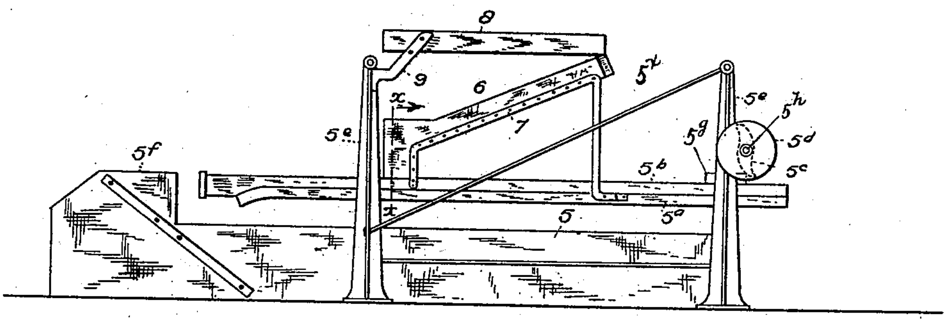

Fig. 1.

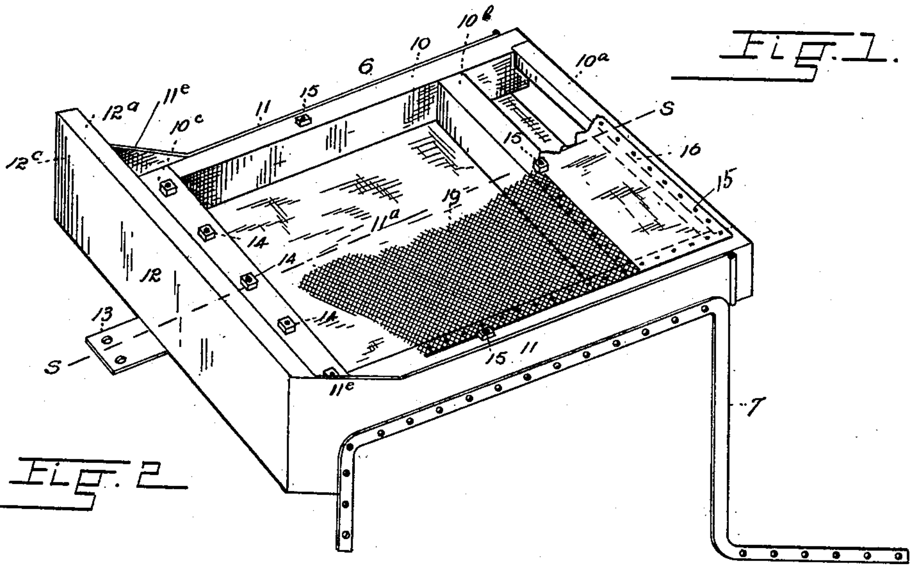

Fig. 2.

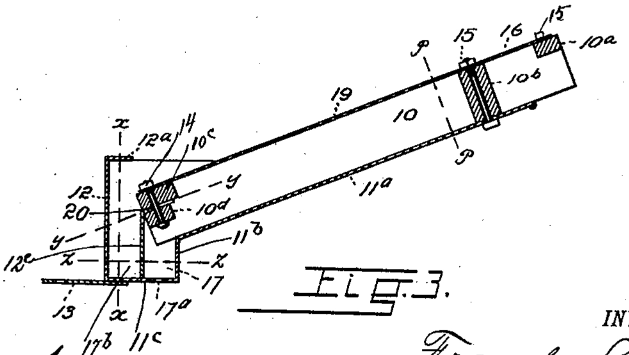

Fig. 3.

WITNESSES:

Alex. J. Stewart

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INVENTOR

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THE NORRIS PETERS CO. PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

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No. 600,096.

Patented Mar. 1, 1898.

FIG. 4.

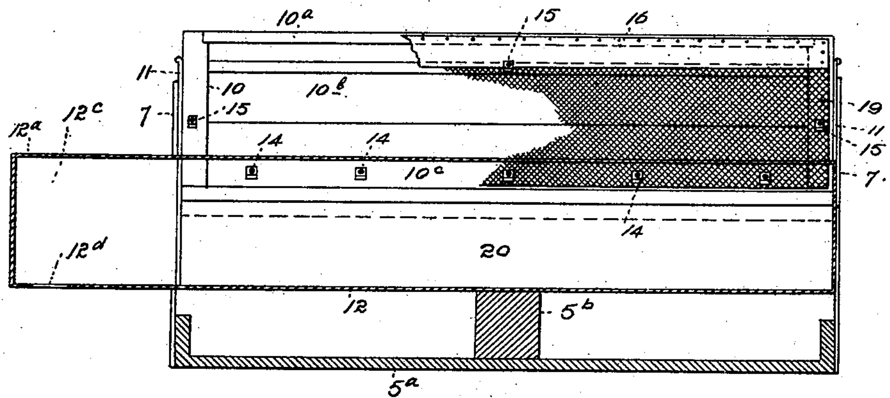
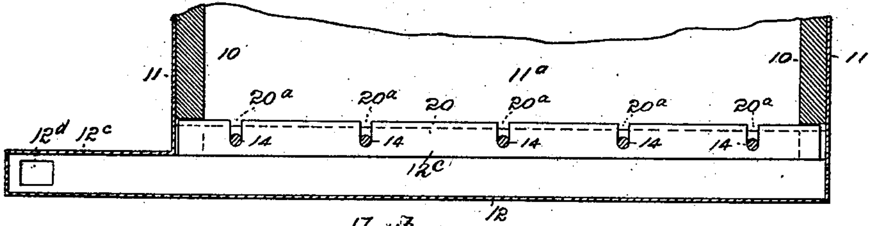


FIG. 5.



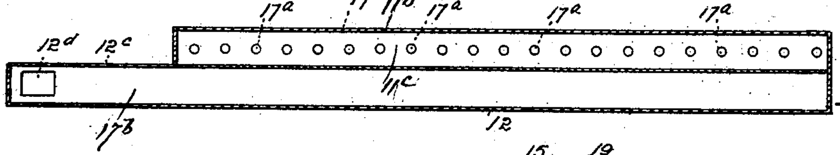


FIG. 6.

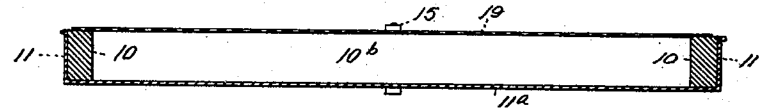


FIG. 7.

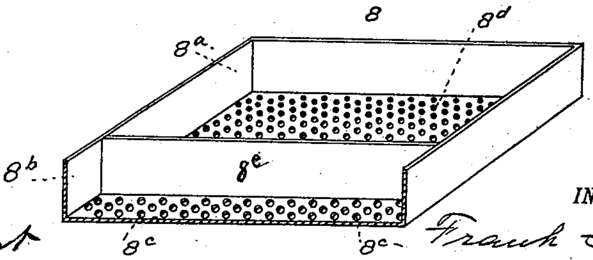


FIG. 8.

WITNESSES:

Alex. J. Stuart

Thomas Durant

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UNITED STATES PATENT OFFICE.

FRANK SOPER, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO
CAROLINE A. McCLEES, OF SAME PLACE.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 600,096, dated March 1, 1898.

Application filed December 24, 1895. Serial No. 573,186. (No model.)

To all whom it may concern:

Be it known that I, FRANK SOPER, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore-Concentrators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in devices for use in connection with a concentrator to be attached to concentrators now in use or otherwise employed for treating gangue.

This invention is directed to improvements in the details of construction whereby the device is made more compact, rendered less liable to injury, and capable of performing more work, and this in a more satisfactory manner.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation showing my improvements in position on the table. Fig. 2 is a perspective view of the invention with portions broken away, the view being on a larger scale. Fig. 3 is a vertical longitudinal section on the line *s s* of Fig. 2. Fig. 4 is a vertical transverse section on the line *x x* of Fig. 1, looking in the direction of the arrows. Fig. 5 is a section taken on the line *y y* of Fig. 3, looking down. Fig. 6 is a section on the line *z z* of Fig. 3, looking down. Fig. 7 is a vertical transverse section on the line P P of Fig. 3. Fig. 8 is a sectional perspective view of the feed-box removed.

Like numerals of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by numerals, 5 represents the concentrator, and 5^a the bumping-table, and 5^b the center timber, which is designed to receive the shock of the bump by coming in contact with the abutment 5^f. On this center timber is the projection or lug 5^g, which is adapted to be engaged at predetermined intervals by the cam 5^c on the shaft 5^h, which is extended at one end and carries thereon the pulley 5^d, which is designed to receive its power by belt from any suitable source. (Not shown.)

5^e are pillars or uprights, one of which is provided with suitable bearings for the shaft 5^h and the other of which serves as a support for the feed-box, which will soon be described. The spring usually employed for returning the table is not shown, but should be employed. As the construction and mode of operation of these bumping-tables form no part of the present invention and as this part of the machine is or may be of any of the well-known forms, no further description thereof is deemed necessary. The apparatus should be supported upon a solid and firm base, and the pillars or uprights may be braced, as by the inclined braces $5^{\times}$. The parts constituting my invention are designed to be supported above and by this bumping-table.

6 represents the screen. It is disposed at a greater or less inclination, as may be found most expedient. It is supported above the table by the metallic pieces 7, of the shape shown, having two substantially parallel vertical portions of different lengths and the horizontal portion designed to be secured to the sides of the table in any suitable manner. This screen is composed of the side bars 10, the top rear bar 10^a, the front top cross-bar 10^c, and the transverse partition 10^b, all as seen in Fig. 2.

19 is the screen of the required mesh, secured to the upper face of the said side and end bars in any suitable manner, as by the vertical bolts 14 and 15, that part 16 of the top between the end bar 10^a and the partition 10^b being imperforate, as seen in Figs. 2 and 3, and is designed to break the fall of the pulp and prevent unnecessary wear upon the screen. The imperforate bottom 11^a is suitably secured to the under faces of the side bars of the screen and to the partition 10^b, as seen best in Fig. 3, and at its lower end this bottom is extended vertically, as seen at 11^b, and thence horizontally, as seen at 11^c. The side bars of the screen-frame are provided with the metallic facing-strip 11, which

strip is extended across the end of the frame, as seen at 12, and the upper edge turned horizontally, as seen at 12^{a}. A strip 13, secured to the under side of the portion 11^{c} and provided with holes, as seen in Figs. 2 and 3, serves as a means for securing that end of the screen to the central timber 5^{b} of the bumping-table.

The space between the walls 11^{b} and 12 is divided by the vertical partition 12^{c}, the upper end of which is bent at an angle and extended parallel with the screen 19, this inclined portion 20 being provided with open-ended slots 20^{a}, as seen in Fig. 5, for the passage of the bolts 14, which hold it between the under face of the bar 10^{c} and a parallel bar 10^{d}, as seen best in Fig. 3. This forms two receptacles or chambers 17 and 17^{b}, as seen in Figs. 3 and 6—one for the reception of the gangue that passes over the screen and the other for the pulp that passes through the said screen. The bottom wall of the chamber 17 is provided with openings 17^{a}, as seen in Figs. 3 and 6. The chamber 17^{b} is extended laterally at one end, as seen in Figs. 4, 5, and 6, and its bottom wall is provided with the opening 12^{d}, as is also shown in said views. The metal strip 11 is extended at this end, as seen at 11^{e} in Fig. 2. This screen appliance, being mounted on the table, must of necessity move with it, and therefore receives the "bump" given to the table. This bump throws the gangue forward down the screen and at the same time plays an important part in shaking the small particles loose from the meshes of the screen and prevents the clogging thereof.

8 represents the feed-box. It is supported from the forward pillars or uprights 5^{c} by the arms 9, as seen in Fig. 1, and has a perforated bottom, as shown in Fig. 8, and a vertical partition 8^{e}, dividing it into two compartments 8^{a} and 8^{b}, as seen in Fig. 8. Into the compartment 8^{b} the pulp is designed to be fed, while into the compartment 8^{a} is designed to flow a stream of pure water from any suitable source. This box is supported stationarily above the screen in such a position that pulp falling through the perforations 8^{c} will fall upon the metallic imperforate surface 16, from whence it flows in an even stream onto the screen 19 below. The water from the pulp immediately sinks through the screen, leaving some of the very fine mineral adhering to the gangue, which is too course to pass through the screen. For the purpose of washing this fine material loose water is caused to run through the perforations 8^{d} and fall onto the screen. The discharge-opening 12^{d} is beyond the side of the table, as seen in Fig. 4.

With the parts constructed and arranged substantially as above set forth, the construction being the preferable form of carrying out the invention, the operation will be readily understood, especially when taken in connection with the foregoing description and the annexed drawings, and a further detailed description thereof is not deemed necessary.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. The combination of a bumping-table with an imperforate bottom, a screen mounted in an inclined position on said table and comprising side and end bars, a top with reticulated and imperforate portions, having two chambers or receptacles at its lower end, and a suitable feed-box, substantially as described.

2. The combination of a bumping-table with imperforate bottom, a screen mounted in an inclined position on said table and comprising side and end bars, a top with reticulated and imperforate portions having two chambers or receptacles at its lower end and a divided feed-box with reticulated bottom mounted above the screen, substantially as described.

3. A screen appliance composed of the side and end bars, the top with reticulated and imperforate portions, the receptacle at the lower end, the vertical partition with upper end inclined parallel with the top, the bar parallel with the end bar and means for holding the upper end of the partition between the end bars, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK SOPER.

Witnesses:
E. S. COUNSELOR,
H. C. CHILDS.